

High Pressure Oxygen Generation for Future Exploration Missions, Phase I

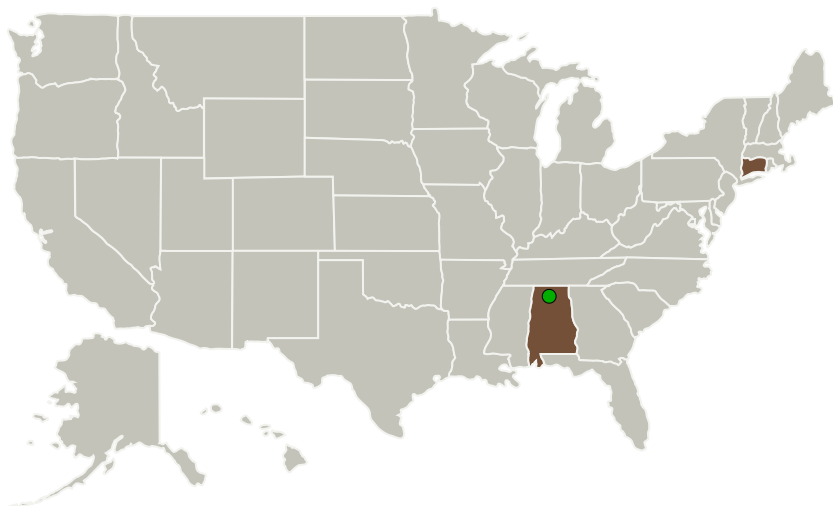
Completed Technology Project (2014 - 2014)




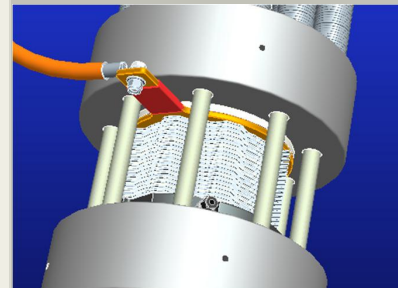
Project Introduction

The proposed innovation is the development of a cathode feed electrolysis cell stack capable of generating 3600 psia oxygen at a relevant scale for future exploration missions. This innovation is relevant to NASA's need for compact, quiet, efficient, and long-lived sources of pressurized oxygen for atmosphere revitalization (AR) and EVA oxygen storage recharge. Present AR equipment aboard International Space Station (ISS) consists of power-intensive, noisy compressors that have service lives less than 2 years. Proton's proposed electrolyzer stack will eliminate the need for these compressors, by developing a cell stack that can produce 3600 psia oxygen via electrochemical compression. This innovation results in a quiet, efficient solid state device with no internal moving parts to service or fail.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Proton Energy Systems, Inc.	Lead Organization	Industry	Wallingford, Connecticut
 Marshall Space Flight Center (MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama



High Pressure Oxygen Generation for Future Exploration Missions Project Image

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Primary U.S. Work Locations

Alabama

Connecticut

Project Transitions



June 2014: Project Start

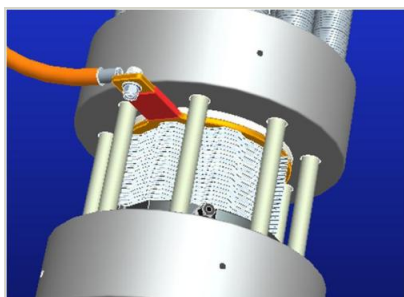


December 2014: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140543>)

Images



Project Image

High Pressure Oxygen Generation
for Future Exploration Missions
Project Image

(<https://techport.nasa.gov/image/128152>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Organization:

Proton Energy Systems, Inc.

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Luke Dalton

Co-Investigator:

Luke Dalton

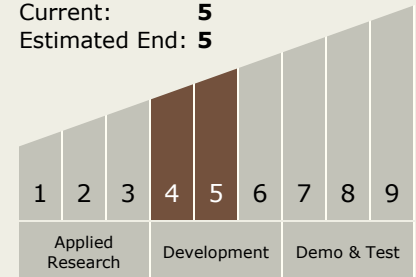
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Technology Maturity (TRL)

Start: 4
Current: 5
Estimated End: 5



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
 - └ TX06.1.1 Atmosphere Revitalization

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System